

CLAIMS

1. A method for providing an energy saving service comprising: a constant identification step in which an inverter having an automatic tuning function for identifying a motor constant of a motor or a program of said inverter is provided to a user of said motor or a product with said motor, and a voltage is forcedly applied to said motor by using said provided inverter to identify said motor constant; and an inverter control step in which said inverter for driving said motor by said motor constant obtained in said constant identification step is controlled so as to operate at an efficient operating point of said motor, wherein said motor being a synchronous machine is driven by said inverter, using said identified motor constant.

2. The method for providing an energy saving service according to claim 1, wherein said motor is driven while grasping variation in a counter-electromotive voltage constant obtained in said constant identification step.

3. The method for providing an energy saving service according to claim 1 or 2, further comprising: a performance evaluation step in which said motor is driven by said motor constant obtained in said constant identification step to evaluate the performance of said motor, wherein a motor and an inverter selected on the basis of the evaluation result of the performance of said motor obtained in said performance evaluation step are used.

4. The method for providing an energy saving service according to any one of claims 1 to 3, further comprising: an operating specifications evaluation step in which said

inverter for identifying the motor constant of said motor and a sample motor for grasping operating environment such as load torque of said product are provided for said user, and said sample motor installed in said product is driven by said inverter to evaluate the operating specifications of said product; and a specifications decision step in which the specifications of a motor to be used in said product are decided on the basis of an operating parameter extracted in said operating specifications evaluation step.

5. The method for providing an energy saving service according to claim 4, further comprising: a storing step, in which the operating parameter extracted in said operating specifications evaluation step is stored in a server as numerical data through the Internet; and a specifications decision step, in which the specifications of said motor are decided on the basis of said operating parameter stored in said server in said storing step.

6. The method for providing an energy saving service according to any one of claims 1 to 5, further comprising: a performance evaluation step in which a motor before an exchange is driven by said inverter or said program of said inverter to evaluate its performance; and a motor specifications decision step in which the specifications of a motor after the exchange are decided so as to improve the performance of a product with said motor after the exchange, on the basis of the evaluation results of the performance of said motor before the exchange obtained in said performance evaluation step, wherein said motor before the exchange is an induction motor or a rectangular wave drive permanent magnet motor, and said motor after the exchange is a sine wave drive permanent magnet motor.

7. The method for providing an energy saving service according to any one of claims 1 to 6, further comprising: a performance evaluation step in which when the motor is exchanged, said motor before the exchange is driven by said inverter for identifying a motor constant of said motor, to evaluate the performance of said motor before the exchange; a motor specifications decision step in which the specifications of the motor after the exchange are decided so as to improve the performance of a product with said motor after the exchange, on the basis of the evaluation results of the performance of said motor before the exchange obtained in said performance evaluation step; and an energy saving price calculation step in which an energy saving price corresponding to electric power consumption is calculated on the basis of difference between power consumption data in the case of using a motor having specifications decided in said motor specifications decision step and current power consumption data, wherein said energy saving price is reflected on a charge for the provision of said inverter and said motor.

8. The method for providing an energy saving service according to any one of claims 1 to 7, wherein said motor is driven by said inverter by position sensor-less.

9. The method for providing an energy saving service according to any one of claims 1 to 8, wherein the inverter having the automatic tuning function for identifying the motor constant of said motor or the program of the inverter drives said motor, and the efficiency of said motor is successively grasped by said motor constant identified during operation.

10. The method for providing an energy saving service

according to any one of claims 1 to 7, wherein said inverter having the automatic tuning function for identifying the motor constant of said motor or the program of the inverter is provided at the start of a service contract for providing energy saving.

11. A method for deciding the specifications of a motor comprising: an operating specifications evaluation step in which a driving device for identifying a motor constant of a motor and a sample motor for grasping operating environment are provided for a customer who has purchased or will purchase a motor, and said sample motor installed in a product is driven by said driving device to evaluate operating specifications; and a specifications decision step in which the specifications of the motor to be supplied are decided on the basis of an operating parameter extracted in said operating specifications evaluation step.

12. The method for deciding the specifications of a motor according to claim 11, further comprising: an operating parameter storing step in which the operating parameter extracted in said operating specifications evaluation step is stored in a server as numerical data through communication means such as the Internet; and a specifications decision step, in which the specifications of a permanent magnet motor to be supplied are decided on the basis of said operating parameter stored in said server.

13. A method for providing a compressor version-up service comprising: an operating specifications evaluation step in which a driving device for identifying a motor constant of a permanent magnet motor is provided for a customer who has purchased or will purchase a compressor with said permanent

magnet motor, and said driving device drives said permanent magnet motor installed in said compressor to extract a motor constant of said permanent magnet motor such as a counter-electromotive voltage constant; an efficiency grasping step in which the efficiency of a product is grasped from variation in said motor constant of said permanent magnet motor obtained in said operating specifications evaluation step, said compressor with said permanent magnet motor being installed in said product; and an efficiency reduction report step in which an efficiency improvement measure such as the timing of exchanging said compressor is reported, when the efficiency of said product obtained in said efficiency grasping step is reduced.

14. The method for providing a compressor version-up service according to claim 13, wherein reduction in the efficiency is reported by an alarm, an indicator lamp, or the like, when the efficiency obtained in said efficiency grasping step is reduced.

15. A method for providing an energy saving service using a driving device of a permanent magnet motor comprising: a service contract conclusion step in which a service contract is concluded with a customer who has purchased or will purchase a product with a permanent magnet motor; a driving device provision step in which a driving device which can drive any permanent magnet motor with different specifications is provided on the basis of said service contract; and a product upgrade step in which said driving device controls the drive of said permanent magnet motor so as to improve the performance of the product with said permanent magnet motor, to upgrade the product with said permanent magnet motor.

16. A method for providing an energy saving service using a driving device of a permanent magnet motor comprising: a service contract conclusion step in which a service contract is concluded with a customer who has purchased or will purchase a product with a permanent magnet motor; a driving device provision step in which a driving device which can drive any permanent magnet motor with different specifications is provided on the basis of said service contract; and a motor supply step in which the driving device provided in said driving device provision step drives a plurality of permanent magnet motors having different specifications, and a motor to be supplied is determined on the basis of the evaluation results of the performance of products by the identical driving device.

17. A method for providing an energy saving service using a driving device of a permanent magnet motor comprising: a driving device provision step in which a driving device of a permanent magnet motor which can drive any permanent magnet motor with different specifications by identifying a motor constant is provided for a customer who purchases a permanent magnet motor to manufacture a product with said permanent magnet motor; and a motor provision step in which said driving device drives said permanent magnet motor installed in said product, to provide a permanent magnet motor coinciding with product specifications required by said customer.

18. A method for providing an energy saving service using a driving device of a permanent magnet motor comprising: a service contract conclusion step in which a service contract is concluded with a customer who has purchased or will purchase a product with a permanent magnet motor; a driving device provision step in which a driving device which can

drive any permanent magnet motor with different specifications by identifying a motor constant is provided on the basis of said service contract; and a motor specifications decision step in which the specifications of a motor to be supplied is decided on the basis of the evaluation results of the performance of said product, said driving device provided in said driving device provision step driving said permanent magnet motor in said product.

19. A method for providing an energy saving service using a driving device of a permanent magnet motor comprising: a service contract conclusion step in which a service contract is concluded with a customer who has purchased or will purchase a product with a permanent magnet motor; a driving device provision step in which a driving device which can drive any permanent magnet motor with different specifications is provided on the basis of said service contract; and a motor specifications decision step in which the specifications of a motor to be supplied to said customer are decided on the basis of the evaluation results of the performance of said product, the driving device provided in said driving device provision step driving said permanent magnet motor in said product, wherein an energy saving price corresponding to saving in electric power consumption is calculated on the basis of difference between power consumption data in the case of using the permanent magnet motor decided in said motor specifications decision step and current power consumption data, and said energy saving price is reflected on a charge for the provision of said driving device and said permanent magnet motor.

20. A method for exchanging a compressor comprising: an operating specifications evaluation step in which when a

motor-driven old compressor used in a refrigeration cycle is exchanged for a new compressor, an inverter for identifying a motor constant of a synchronous motor with different specifications installed in an alternative compressor is provided together with said alternative compressor, and said inverter drives said synchronous motor installed in said alternative compressor to operate said refrigeration cycle, thereby extracting a motor constant of said synchronous motor such as a counter-electromotive voltage constant; and a step of operating said refrigeration cycle in which said inverter drives said alternative compressor by use of the motor constant of said synchronous motor obtained in said operating specifications evaluation step, wherein said alternative compressor is used in an emergency measure until said new compressor is used.

21. A freezing/air conditioning device comprising: a permanent magnet motor operated at variable speed by an inverter having an automatic tuning function or a program of the inverter, the inverter being able to identify a motor constant of a motor; a compressor driven by said permanent magnet motor, for discharging a refrigerant circulating through a refrigeration cycle; and a monitor device for monitoring performance such as the range of output or reduction in efficiency by grasping said motor constant identified during operation.